

## Environmental Consequences

**Table 2** at the end of the previous section summarizes the environmental consequences by significant issue for each alternative. Environmental consequences include the direct and indirect effects of an alternative, as well as a disclosure of an alternative's cumulative effects. Cumulative effects for the proposed action and other action alternatives are primarily based on their connection to similar effects from past, present, and reasonably foreseeable future actions. Individual effects of past actions have not been listed or analyzed and are not necessary to describe the cumulative effects of this proposal or the alternatives. (CEQ Memorandum, Guidance on the Consideration of Past Actions in Cumulative Effects Analysis, June 24, 2005).

Major past actions over the last 30-35 years should be recognized for their influence on current setting conditions, visitor attitudes, and the ability to meet setting objectives for the Semiprimitive shoreline. These past actions are being highlighted now because they contribute to the cumulative effects of proposed management changes. These major past actions include:

- construction of three developed campgrounds on the eastern lakeshore in 1971, including their paved access roads and boat ramps,
- imposing a 10-mph boat speed limit for Waldo Lake by the Oregon State Marine Board in 1973, and a no-wake speed zone within 300 feet of the shoreline in 1986,
- designating the Waldo Lake Wilderness around the north, west and south sides of the lake in 1984, and
- discontinuing the annual stocking of hatchery fish in Waldo Lake by the Oregon Department of Fish and Wildlife (ODFW) in 1991.

Facility developments have substantially increased the number of recreation visitors to Waldo Lake with most overnight visitors staying in the three developed campgrounds. Improved road access and boat ramps also have increased the number and variety of recreational boats on Waldo Lake. Conversely, imposing a boat speed limit and discontinuing the fish stocking program have likely reduced the number and variety of motorized boats at Waldo Lake over time. Finally, designating the Waldo Wilderness has influenced recreation management objectives around the lake, and possibly has helped to shape the public's expectations for recreation experiences on the Semiprimitive shoreline. Further discussions of the influence of these past actions can be found under individual issues and alternatives.

All action alternatives are designed to reduce the effects that motorized recreation has on visitor experiences on the Semiprimitive shoreline around Waldo Lake. Proposed restrictions on motorized uses at Waldo Lake would create minimal ground disturbance (e.g. placement of regulatory and information signs at boat launches/trailheads) and would not affect activities within the three developed campgrounds. This proposed action does not change recreation facilities, except signage, in the developed campgrounds on the eastern shores of Waldo Lake. This proposed action also does not change recreation trails or visitor activities on trails within the Waldo Lake subwatershed.

## Significant Issues

### Motorized Disturbances to Semiprimitive Shoreline Visitors

#### Affected Environment of Motorized Disturbances to Semiprimitive Shoreline Visitors

The surface of Waldo Lake is currently designated a *Roaded Natural* setting. *Roaded Natural* settings are common in the central Cascade Mountains and are characterized by road and trail access, and visitor conveniences (e.g. improved access, directional signing, toilets, campgrounds, potable water). *Roaded Natural* settings also possess on-site visitor management (e.g. regulatory signs and posters, staff patrols) and show evidence of human modification to vegetation. In exchange for easy access and visitor conveniences, visitors in *Roaded Natural* settings can expect to share the area with others. Visitors to these settings would not expect to apply technical outdoor skills or to assume high levels of personal risk during their trips. Waldo Lake's three campgrounds are appropriately designated *Roaded Natural* settings by the Forest Plan.

Most of Waldo Lake's shoreline is designated as a *Semiprimitive Nonmotorized* recreation setting. *Semiprimitive (Nonmotorized or Motorized)* settings are intended to provide visitors with a backcountry escape from concentrated human activity. *Semiprimitive Nonmotorized* settings lack visitor conveniences, improved access, and designed landscape modifications. In optimal *Semiprimitive* settings visitors have few interactions with people outside their group and experience a sense of solitude and remoteness. These *Semiprimitive* settings do require visitors to apply their technical outdoor skills and to assume the personal risks of isolation and remoteness. **Table 3** describes ROS criteria standards for the lake surface and shoreline management areas to highlight differences in setting objectives under current management conditions. More detailed descriptions of these criteria can be found in Appendix A of this document.

**Table 3:** Criteria Standards for Current ROS Settings at Waldo Lake

	Lake Surface	Shoreline
ROS Class	Roaded Natural	Semi-Primitive Nonmotorized
Access	Motorized travel	Non-Motorized travel
Remoteness	Of little relevance	Distant sights & sounds of human activity; >1/2 hour walk from motorized travel ways

Access norms for a *Semiprimitive Nonmotorized* setting are nonmotorized trails or cross-country travel. Unfortunately, motorized boats traveling along the shoreline of Waldo Lake create setting conditions similar to a motorized roadway. In this sense, motorized boats on Waldo Lake are inconsistent with ROS Access standards intended for a Waldo Lake shoreline experience. Visitors seeking to remove themselves from developed site conveniences and the distractions of motors can be negatively affected by both the sights and sounds of nearby motorized travel. While backcountry visitors may react more strongly to hearing a motorized vehicle than seeing it, the simple sight of a motorized vehicle can contrast with the experience these shoreline visitors are expecting.

Remoteness criteria for *Semiprimitive Nonmotorized* settings specify that visitors should experience only the “distant sights and sounds of human activity” and lists “a half-hour walking distance from motorized travel ways” as a physical gauge for describing this setting. Current motorized activities near the Dispersed Recreation, Semiprimitive Nonmotorized shoreline are inconsistent with these ROS Remoteness criteria particularly during the busy days of late summer when boat traffic is higher. Motorized boaters introduce visual and auditory distractions that conflict with the solitude and remoteness intended for the *Semiprimitive Nonmotorized* experience assigned to the shoreline of Waldo Lake. Motorized boats also increase the potential for social encounters between boaters and visitors at shoreline sites by increasing the travel range of boaters. The ease with which human sights and sounds can carry across lake surfaces helps disturbance from motorized activities to compromise the remote experience of a *Semiprimitive* setting. This is particularly true around popular shoreline areas where the density of dispersed sites is higher.

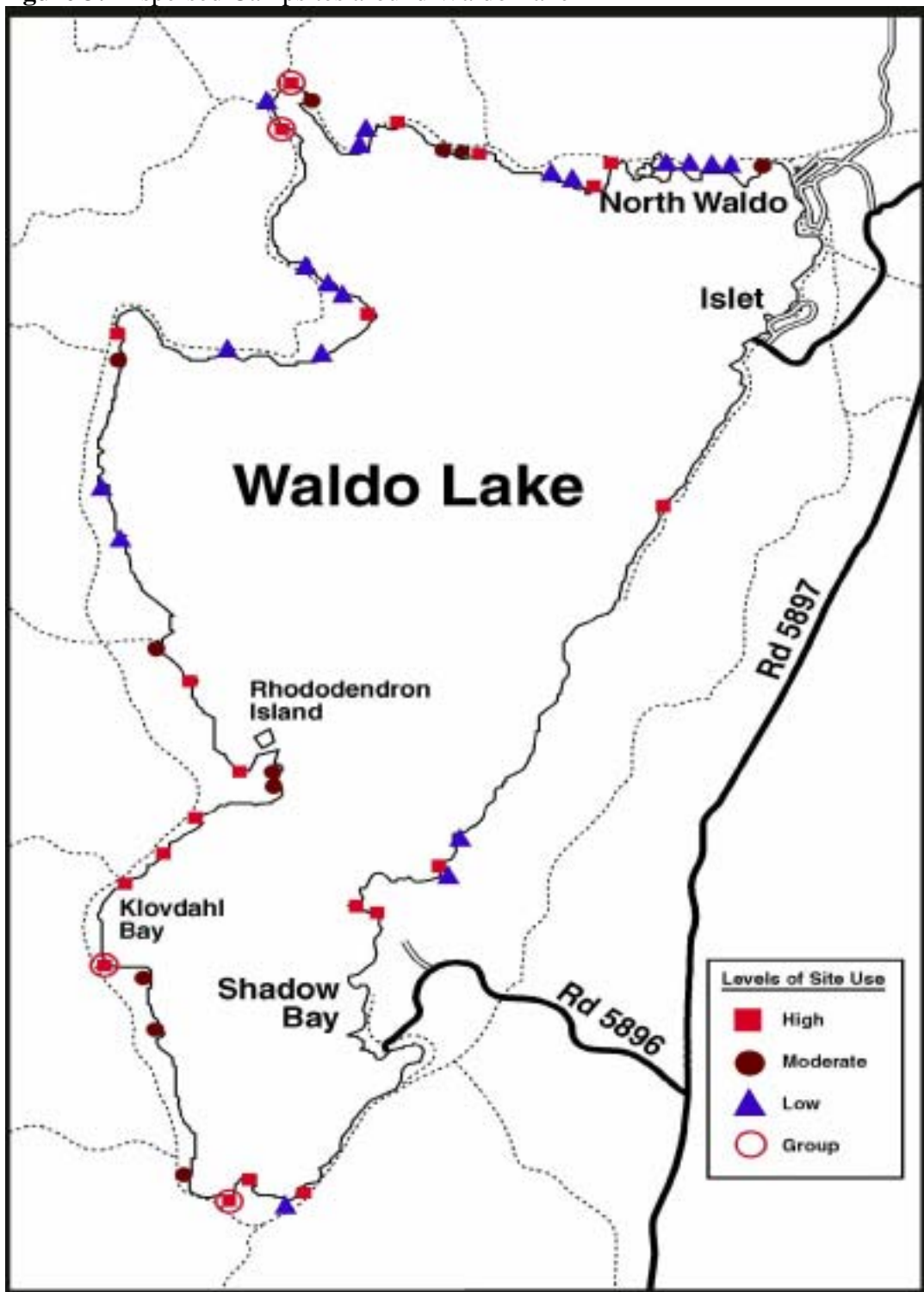
Currently, shoreline visitors are less likely to experience a sense of solitude and remoteness at the 21 dispersed sites within one mile of the three developed campgrounds, due to the number of social encounters with passing boaters and motorized disturbances coming from the campgrounds. Visitors at the 29 more distant shoreline sites on Waldo Lake have a greater potential to offer visitors the solitude and remoteness of a *Semiprimitive* setting. However, the travel range of motorized boats can introduce motorized disturbance to visitors at these distant shoreline sites. Occasionally, a party of dispersed campers will use a generator or chainsaw at their shoreline site to meet their comfort needs and consequently their use will disturb neighboring sites. Disturbance from these mechanical devices can extend out a mile to influence a number of neighboring sites.

For this analysis, geographic extents for motorized disturbances are defined to help assess the potential that a given alternative has in meeting recreation experience objectives for the *Semiprimitive Nonmotorized* setting around Waldo Lake. Motorized disturbances are separated into visual and auditory elements for various devices that have been experienced annually by shoreline visitors.

**Table 4** summarizes the geographic extent of motorized devices influencing the shoreline setting. Distances assigned to each device are based on agency experience at Waldo Lake and the ROS criteria of “½ -hour walk from a motorized travelway”. In this analysis, a “½ -hour walk” is assumed to equal a one-mile walking distance on a trail.

Disturbances from overhead aircraft and trains near Highway 58 are excluded from this analysis because they are far enough away to be considered part of the “distant sights and sounds of human activity” used to define a *Semiprimitive Nonmotorized* setting. Other human disturbances (e.g. human voices, dogs, and loud music) can also influence the experiences of shoreline visitors but will not change between alternatives in this analysis. This proposed action only changes motorized activities on Waldo Lake and its *Semiprimitive* shoreline.

For this analysis, the *Semiprimitive* shoreline area will be represented by 51 established dispersed sites scattered around Waldo Lake to help show differences between alternatives. While most dispersed campers stay at one of these established sites, visitors are free to camp anywhere around the lake with a few exceptions. Camping closures exist for the islands, for areas too close to a developed campground, and for the Charlton burn area along the northern shore of Waldo Lake. For this analysis, the burn area closure was established for safety reasons and is assumed to be temporary. Therefore shoreline sites within the burn area will be included in the shoreline area analyzed. **Figure 3** shows the approximate location of these 51 dispersed sites around Waldo Lake.

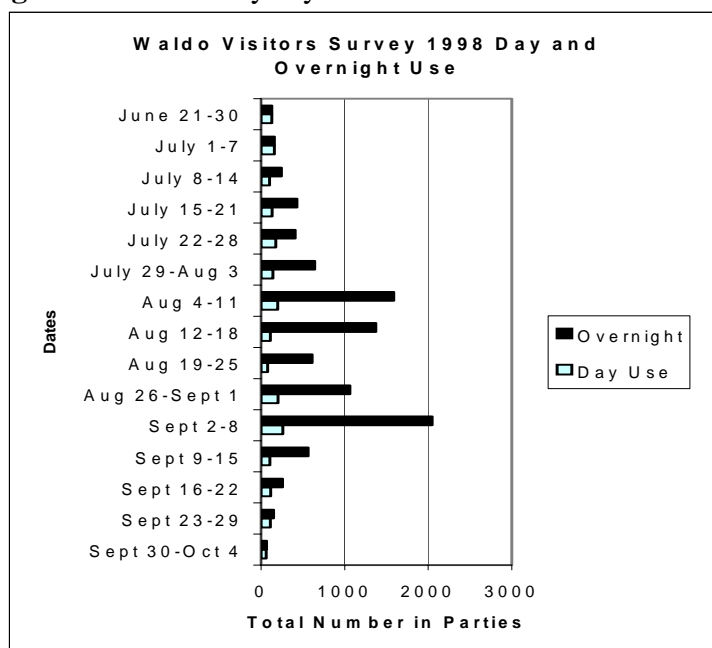
**Figure 3:** Dispersed Campsites around Waldo Lake

This analysis also defines the summer/fall recreation season as being 150 days long. The actual length of the summer/fall season will vary from year to year based on weather conditions, but is rarely more than 150 days long. A listed effect of 150 days for a motorized device is meant to infer that the device's effects could be experienced at any time during the summer/fall recreation season.

**Table 4:** Geographic Extents of Disturbance from Motorized Devices on Waldo Lake Shoreline Sites.

Motorized Device	Visual Extent	Auditory Extent
Boat Motor – 2-cycle	Up to 1 mile	Up to 1 mile
Boat Motor – 4-cycle	Up to 1 mile	Up to ¼ mile
Boat Motor – Electric	Up to 1 mile	Up to 100 feet
Chainsaws, Generators	Up to 500 feet	Up to 1 mile
Floatplanes, helicopters	Entire lake surface	Entire lake surface
Motors in Campgrounds	Up to ¼ mile	Up to 1 mile

**Figure 4:** Visitor Days by Week at Waldo Lake in 1998



*Footnote: A drop in 1998 use levels during week of August 19-25 demonstrates how bad weather can influence summer visitation levels*

### Direct and Indirect Effects of Motorized Disturbances to Semiprimitive Shoreline Visitors

**Table 5** below summarizes, by alternative, the number of shoreline sites that potentially could be influenced by motorized devices and how many days of the season that these devices would be allowed to operate on or around Waldo Lake's undeveloped shoreline.

**Table 5:** Effects of Motorized Influences on Semiprimitive Shoreline Visitors around Waldo Lake by Type of Influence and Alternative

Types of Motorized Influences		Alternative 1 (No Action)		Alternative 2		Alternative 3		Alternative 4 (Preferred)		Alternative 5	
		# Sites <sup>1</sup>	# Days <sup>1</sup>	# Sites	# Days	# Sites	# Days	# Sites	# Days	# Sites	# Days
Visual	Boat Motor - 2 cycle	51	150	0	0	0	0	0	0	0	0
	Boat Motor - 4 cycle	51	150	51	150	51	90	0	0	0	0
	Boat Motor -Electric	51	150	51	150	51	150	51	150	0	0
	Generators/Chainsaws <sup>2</sup>	51	150	51	150	51	90	0	0	0	0
	Landing Floatplanes	51	150	51	150	0	0	0	0	0	0
Auditory	Boat Motor- 2 cycle	51	150	0	0	0	0	0	0	0	0
	Boat Motor- 4 cycle	51	150	51	150	51	90	0	0	0	0
	Boat Motor - Electric	0	150	0	150	0	150	0	150	0	0
	Generators/Chainsaws <sup>2</sup>	51	150	51	150	51	90	0	0	0	0
	Landing Floatplanes	51	150	51	150	0	0	0	0	0	0

<sup>1</sup> Describes the number of shoreline sites that are susceptible to this type of motorized influence, and the number of days that such influences are allowed to occur at Waldo Lake.

<sup>2</sup> Refers to the operation of these devices by visitors at dispersed sites along the shoreline of Waldo Lake.

**Access** - Alternative 1 (No Action) would continue motorized boat and floatplane access on Waldo Lake. These activities would continue to influence the recreation experiences of dispersed site visitors with motorized disturbance (sight and sound) that does not meet *Semiprimitive Nonmotorized* setting standards. Motorized lake traffic is more frequent and has greater potential to affect shoreline visitor experiences during a 60-day peak-use period between Mid-July and Mid-September. **Figure 4** shows peak use in 1998 occurring from early August to Labor Day weekend. Even during the months of June and late September when visitor use is lower, a motorized boat traveling along the shoreline or a floatplane touching down and leaving the lake surface can easily influence visitor experiences at a number of shoreline sites. Boaters on Waldo Lake often travel within ½ mile of the shoreline either to satisfy their sightseeing curiosity or to avoid adverse wind and wave action. This travel pattern allows a small number motorized boats to influence many shoreline sites on any given day of the season.

With the current use patterns of motorized boats (Appendix B) and the occasional floatplane, Alternative 1 would continue recreation activities that cause shoreline visitors to experience the sights and sounds of motorized access. These activities have the potential to influence visitor experiences at any of the 51 dispersed sites around the lake on any day during the 150-day recreation season. Again, the potential for motorized disturbance is highest during the 60-day peak summer season, and varies by shoreline location.

At four dispersed sites close to Shadow Bay campground, visitors are almost guaranteed of seeing and/or hearing vehicle traffic in this campground. Visitors at another 18 sites located within one mile of these campgrounds have a good chance of hearing motorized disturbance from the nearest campground, though they may never see this traffic. Additionally, visitors to these 22 close-in sites

have a greater chance of experiencing motorized boat traffic than other shoreline visitors because these sites lie along common travel routes for boaters leaving a boat launch and heading for a distant site or day cruising about the lake. Visitors to the 29 more distant sites have a lower potential of being affected by any motorized traffic, though they still remain vulnerable to experiencing motorized disturbance under Alternative 1.

Visitors seeking a *Semiprimitive* experience at Waldo Lake under Alternative 1 would do best to avoid the 60-day peak summer recreation season, especially on the weekends (Friday through Monday) when recreation use is highest. The remaining 90 days of the recreation season offer them a greater potential to escape motorized traffic. However, Alternative 1 would offer no guarantee on any day that visitors will experience a shoreline setting that is free of the visual or auditory disturbance of motorized traffic near the lake.

All action alternatives generally bring shoreline setting conditions closer to ROS Access standards for a *Semiprimitive* setting, but to varying degrees. Alternative 2 makes the least change from current conditions by removing only 2-cycle boat motors from Waldo Lake. Alternative 2 would continue to allow the presence of other motorized traffic (4-cycle and electric boat motors, floatplanes) to influence the recreation experiences of shoreline visitors. By doing so, Alternative 2 does not improve setting conditions to fully meet ROS Access standards and offer visitors a *Semiprimitive Nonmotorized* setting experience on the shoreline.

Alternative 2 would improve a shoreline visitor's chances of escaping motorized traffic by taking the loudest and most common type of boat motor off the lake. The 1998 visitor survey found 2-cycle motors were used on 65.1 percent of motorized boats. By removing 2-cycle boat motors, Alternative 2 could reduce total motorized boat traffic, provided that boaters with 2-cycle motors choose not to reinvest in a 4-cycle or electric boat motor. Our 2003 recreation survey found 75 percent of interviewed visitors were repeat visitors and many had long histories at Waldo Lake. This survey result suggests a strong visitor connection with Waldo Lake and consequently a likelihood that many boaters with 2-cycle motors would not hesitate to reinvest in a new motor. Therefore, Alternative 2 may only create a short-term (2-3 years) reduction in total motorized boat traffic on Waldo Lake.

By removing the more noticeable 2-cycle boat motors, Alternative 2 would lower the potential for shoreline visitors to notice motorized vehicles during their trip, and therefore could increase visitor perceptions of a motor-free setting. In this sense, shoreline visitors are likely to only take auditory notice of those motorized boats (4-cycle) traveling within ¼ mile of their shoreline location.

Alternative 2 would retain the same visual reminders of motorized traffic that shoreline visitors currently experience. That is the sight of a motorized boat may create an unwelcome reminder of motorized traffic for some visitors, though they may not hear the boat.

Alternative 2 would also allow floatplanes to continue visiting Waldo Lake. While floatplanes are uncommon on Waldo Lake, their potential influence on shoreline visitors can be greater than a motorized boat over a similar length of time. Floatplanes are capable of creating a visual and auditory presence that is hard to ignore at Waldo Lake, and their visits would influence a larger geographic area than most motorized boats restricted to 10 mph.

Alternative 3 also would improve the chances for *Semiprimitive* shoreline visitors to escape motorized traffic during the 60-day peak-use period. Alternative 3 would remove all internal combustion motors from the lake surface during this 60-day period, thereby offering visitors more potential to realize a nonmotorized experience at one of the shoreline sites. Visitors to the 22 close-in sites would find setting conditions during the 60-day peak-use period improved by Alternative 3, because the intrusions from passing boaters with internal combustion motors would be gone.

Visitors at the 29 more remote sites would be offered a high potential to experience a setting free of motorized traffic during the 60 day peak-use period. Visitors to all 51 shoreline sites would still have to experience passing boats powered by electric motors under Alternative 3 over the entire 150 day season.

Electric motors are expected to offer most boat owners a sufficient travel range over a day's travel to pass by and influence several shoreline sites. Therefore, Alternative 3 would not technically meet ROS Access standards for the Semiprimitive Nonmotorized shoreline during the 60-day peak summer period. Electric-powered boats would generally need to travel quite close to the shoreline before they would be noticed by shoreline visitors and subsequently identified as motorized traffic. The extent of negative setting influence created by an electric motor boat would most likely depend on the nature of the boat being propelled. For example, a 16-foot canoe or v-hull boat pushed by an electric motor may not create the same image of intrusive motorized access as a 20-foot ski boat propelled by an electric motor. Large boats (> 18 feet) can also have a greater visual effect than smaller boats. In this sense, Alternative 3 retains the potential presence, though with a reduced influence, of motorized boat traffic on Waldo Lake during the 60-day peak-use period by continuing to permit the use of electric boat motors.

For the remaining 90 days of the recreation season, Alternative 3 offers shoreline visitors the same potential to escape motorized traffic as Alternative 2 with one exception. Alternative 3 would prohibit all floatplane access to Waldo Lake over the 150-day summer season. An indirect consequence of prohibiting internal combustion boat motors during a 60-day peak-use period could be more motorized boat traffic during the remaining 90 days than current conditions. Changes in motorized boat use under Alternative 3 would likely be most evident during the week directly prior to and after the 60-day peak-use period when weather conditions are most similar to the peak-use period. Some displaced boaters with internal combustion motors may favor reinvesting in electric motors instead of shifting their trip schedules to early summer or fall.

Alternative 4 would offer shoreline visitors an opportunity to escape motorized traffic for the entire 150-day season by prohibiting all internal combustion motors (boats and floatplanes) on Waldo Lake. On any given day of the summer/fall season, visitors would be free of experiencing most motorized boat traffic by others. Alternative 4 would continue to allow the use of electric boat motors throughout the 150-day season, and thus would retain some motorized influence on shoreline visitor experiences. All in all, Alternative 4 offers a recreation setting containing the same motorized access for 150 days that Alternative 3 offers during the 60-day peak-use period. The continued presence of electric-powered boats technically prevents Alternative 4 from completely meeting ROS Access standards and offering visitors a *Semiprimitive Nonmotorized* setting experience.

Alternative 5 would create the most comprehensive change toward a *Semiprimitive Nonmotorized* recreation experience on Waldo Lake by prohibiting all motorized boats and floatplanes for the entire 150-day recreation season. Alternative 5 would improve setting conditions for all site visitors by removing all motorized boat traffic by other visitors. Visitors to the 22 close-in sites may still be influenced by motorized traffic in the campgrounds. Under Alternative 5, shoreline visitors to the 29 more remote sites on Waldo Lake would find a recreation setting free of the presence of motorized traffic within a mile of their site. Alternative 5 most successfully meets ROS Access standards and offers shoreline visitors a *Semiprimitive Nonmotorized* experience.

**Remoteness** – **Table 5** lists the number of shoreline sites potentially affected by motor sources and the number days that these sources are allowed to operate at Waldo Lake over the 150-day summer/fall season. Information in **Table 5** shows the potential of each alternative to offer shoreline

visitors the remoteness and solitude of a *Semiprimitive* setting by restricting motorized disturbances. Remoteness tracks closely with the ROS Access criteria with respect to mechanical influences on visitor experiences, but Remoteness is a different setting descriptor. Remoteness describes the extent of human disturbances perceived by shoreline visitors and these disturbances are not just confined to methods of travel. Access describes only the types of travel allowed in the recreation setting, and indirectly the potential for these travel methods to influence visitor experiences. This proposed action would improve recreation experiences only by changing motorized activities near the undeveloped shoreline of Waldo Lake. Therefore the following discussion of direct and indirect effects will focus on how each alternative affects motorized disturbances on the Remoteness character of the shoreline. A more inclusive discussion of human disturbances on the shoreline setting will occur under the cumulative effects section of this issue.

Alternative 1 would continue to allow the use of motorized devices (boats, floatplanes, generators and chainsaws) around Waldo Lake to influence the recreation experiences of shoreline visitors. Motorized intrusion from such devices could potentially affect any of the 51 sites around Waldo Lake throughout the 150-day summer/fall season. Visitors to the 22 close-in sites would find it especially difficult to escape the motorized travel of others due to more interactions with boaters traveling by on day trips or to more distant shoreline sites. In general, visitors using one of these 22 sites may find it difficult to completely escape the motorized sights or sounds of others. Motorized intrusions into the 22 close-in sites are most common during the 60-day peak-use season and less frequent during the remaining 90 days based on survey data collected in 1998.

Alternative 1 would continue to allow motorized activities around Waldo Lake that could also influence visitors at the 29 more remote shoreline sites. While visitors to these 29 sites have a better chance of finding solitude from the motorized activities of others, they remain vulnerable to disturbance from motor boaters traveling along the shoreline, the use of a generator or chainsaw at nearby sites, and the occasional lake visit by a floatplane.

The frequency of motor disturbances experienced by shoreline visitors is dependent on when visitors schedule their trip. The highest potential for motor disturbances to shoreline visitors occurs on weekends (Friday-Sunday) during the 60-day peak-use period. During these periods of high use, shoreline visitors must select one of a dozen remote sites on the western shoreline if they hope to experience the remoteness and solitude of a *Semiprimitive* setting. Shoreline visitors have a better chance of avoiding motor disturbances at the 29 distant sites on Waldo Lake by scheduling trips outside the peak-use period and on non-holiday weekdays outside of August and early September. However, even when making such scheduling precautions, Alternative 1 offers no guarantee that visitors to the 29 more remote shoreline sites can avoid motor disturbances. Motorized boats have the capability of bringing such disturbance to any site around the lake on any of the 150 days of the season.

Alternative 2 would improve a visitor's potential to enjoy a remote experience on Waldo Lake by eliminating 2-cycle boat motors for the entire 150-day season. Because 2-cycle motors are a common motor type on Waldo Lake and have the greatest geographic extent for disturbance of all boat motors, Alternative 2 would reduce the potential for motorized boats to affect shoreline visitors. Therefore Alternative 2 would improve a shoreline visitor's likelihood of realizing peace and solitude at his or her site. Using the geographic extents in **Table 4**, Alternative 2 would reduce the average auditory influence of motorized boats from 1 mile to  $\frac{1}{4}$  mile off shore and consequently would reduce the frequency that a motor boat could influence shoreline visitors. Alternative 2 would not change the visual extent that motorized boats have or the potential for their visual presence to influence the experiences of shoreline visitors.

Alternative 2 would not change disturbances produced by floatplanes, or the public's use of chainsaws and generators, and therefore would continue the influence of these sources of motorized intrusions on all 51 shoreline sites during the 150-day season. Alternative 2 also would continue to allow the use of 4-cycle boat motors, which helps to extend the number of interactions that boaters can have with shoreline visitors during a day's travel. As such, the continued presence of internal combustion boat motors under Alternative 2 limits the potential for shoreline visitors to find a remote recreation experience around Waldo Lake, particularly during the 60-day peak-use period.

By allowing the use internal combustion boat motors to continue over the 150-day season, Alternative 2 would not change the potential of individual shoreline sites to offer visitors a sense of remoteness and solitude. Such boat motors offer an ease and range of lake travel that allows boaters to interact with a number of shoreline visitors even those at the most remote sites. Removing 2-cycle boat motors would not alter this travel pattern around the lake, though it may reduce the total number of motorized boats along with their frequency of interactions with shoreline visitors for a short period. Based on the emotional connection that visitors have expressed in their public comments, the Forest assumes that many of the boaters with 2-cycle motors will transition to a 4-cycle boat motor within the first 2-3 years of motor restrictions in order to maintain their boating access to Waldo Lake. Under this assumption, Alternative 2 would not substantially reduce total motor boat traffic or its influence on the remoteness character of shoreline sites over the long term.

Alternative 3 would improve a shoreline visitor's potential to experience remoteness and solitude on Waldo Lake by eliminating most motor disturbances during a 60-day period. During this 60-day peak-use period, Alternative 3 would allow only electric boat motors to operate on Waldo Lake. It would also remove public use of chainsaws and generators at shoreline sites, and the infrequent floatplane visit. Within this 60-day peak-use period, shoreline visitors to the 29 more distant shoreline sites on Waldo Lake would have an increased potential of finding solitude and remoteness. A visitor's potential to experience solitude and remoteness would also improve, but to a lesser extent, at the 22 shoreline sites within one mile of a campground. Visitors at these 22 close-in sites would still remain vulnerable to motor disturbances from campgrounds.

In contrast to Alternative 2, Alternative 3 would change the potential of individual shoreline sites to offer a remote setting experience during the 60-day peak-use period by reducing the interactions between motor boaters and shoreline visitors. Reduced interactions by motorized boaters would result from a lower daily travel range for boaters with electric motors and possibly fewer motorized boats during this 60-day peak-use period. The Forest assumes that boaters with an internal combustion motor may be less willing to transition to an electric motor, than to trade-in a 2-cycle for a 4-cycle motor. This assumption is supported by public comments from motorized boaters expressing their concerns about the ability of electric motors to meet their needs. Given this assumption, Alternative 3 would not only remove disturbance from internal combustion motors over the 60-day period, but reduce the total number of interactions with any motorized boat during this period. Visitors at the 29 more distant sites would benefit the most from a lower number of motorized boaters and a reduced travel range for the motorized boats present. Visitors at the 22 close-in sites would also experience improved setting conditions during the 60-day period.

For the remaining 90 days of the summer/fall season, Alternative 3 would offer visitors the same opportunities for remoteness available under Alternative 2. On these days, shoreline visitors would still remain vulnerable to disturbance from 4-cycle and electric motor boat traffic, as well as the use of chainsaws and generators at neighboring shoreline sites. Alternative 3 would remove the few disturbing visits from floatplanes over the entire 150 day season, which is a notable improvement considering the number of shoreline visitors that can be affected during a single plane visit.

By banning internal combustion motors during the 60-day peak-use period, Alternative 3 could indirectly increase motorized boat traffic during the remaining 90 days of the season. Any increase in motorized boat traffic during these days would create more motor disturbances for shoreline visitors and reduced opportunities experiencing remoteness around Waldo Lake than current conditions offer.

Alternative 3 could also indirectly increase the number of interactions experienced by visitors at the 22 close-in sites during the 60-day peak-use period. When denied the use of internal combustion motors, dispersed site boaters may be more inclined to select a close-in site. This change in dispersed site selection would concentrate more use around the 22 close-in sites during the 60-day period, and reduce the potential for visitors to find remoteness at these sites. The 1998 visitor survey found only 20 percent of dispersed site campers used boat motors; therefore an increase in camper densities around the 22 close-in sites during the 60-day peak-use period under Alternative 3 may not be substantial.

Alternative 4 would improve a shoreline visitor's potential to experience remoteness at Waldo Lake by eliminating most disturbances from motorized boats, floatplanes, chainsaws and generators on the shoreline during the 150-day season. Alternative 4 would not change disturbances created by campground activities. However, by removing motor disturbance sources, except electric motor boats, from operating near shoreline sites, Alternative 4 would improve setting conditions for visitors at all 52 sites over the 150-day season. Alternative 4 would retain public use of electric boat motors, and thereby would retain the potential for motorized boat traffic to influence the experiences of shoreline visitors.

Alternative 4 would also improve the potential of individual shoreline sites to offer a remote setting experience during the 150-day season by reducing the daily travel range of motorized boaters and possibly by lowering the total number of motorized boats on the lake. A lower travel range for motorized boaters translates into less motorized boat traffic for the 29 more distant shoreline sites than for the 22 sites within one mile of the campgrounds.

As to lower overall motorized boats on the lake, the Forest assumes that boaters with internal combustion motors may be less enthusiastic about transitioning to an electric motor, than transitioning from a 2-cycle to a 4-cycle boat motor. This assumption is based on the perception that boaters have less confidence in the ability of electric motors to meet their boating needs. If this boater hesitation produces lower numbers of motorized boats on the lake, Alternative 4 would offer shoreline visitors, particularly at the 29 more distant sites, a reduced exposure to motor disturbances and an improved potential to experience remoteness during their trip.

Indirectly, Alternative 4 could create a similar change in the distribution of shoreline campers as described under Alternative 3 for the 60-day peak-use period, but over the entire 150-day season. Any increased concentration of shoreline campers around the 22 close-in sites due to boat motor restrictions under Alternative 4 is again not expected to be substantially greater than current conditions.

Alternative 4 would also improve remoteness conditions for shoreline visitors by eliminating the public's use of generators and chainsaws around the shoreline throughout the 150-day season. Visitors using the 22 close-in sites would still remain vulnerable to motor disturbances from use of these motorized tools in the campgrounds. Visitors at the 29 more remote sites would likely perceive campground activities only as "the distant sounds of human activity".

Alternative 5 would similarly increase the potential for shoreline visitors to experience remoteness and solitude as Alternative 4 with one exception. Alternative 5 would also prohibit the use of

electric boat motors throughout the 150-day season. For the entire 150 day season, Alternative 5 would remove the influences that motorized boat traffic, floatplane visits, or the public's use of chainsaws or generators on *Semiprimitive* shoreline visitors. In doing so, Alternative 5 would offer visitors to the 29 more distant shoreline sites a recreation setting that would be essentially free of nearby motor disturbances. Alternative 5 would also improve setting conditions for visitors to the 22 close-in sites by removing the same motorized disturbances, but existing conditions in neighboring campgrounds could still influence their visit.

Alternative 5 could also create the same indirect effect of concentrating campers around the 22 sites within one mile of the boat launches that was described above for Alternatives 3 and 4. Again, this change in camping behavior would involved less than 20% of dispersed campers who used a motorized boat to access their camp site.

### **Cumulative Effects of Motorized Disturbances to Semiprimitive Shoreline Visitors**

The geographic scope for assessing the cumulative effects of this issue is the Waldo Lake watershed. Past and recent management actions at and around Waldo Lake have influenced the cumulative effects of motorized activities on recreation setting around Waldo Lake's *Semiprimitive* shoreline. Past road and facility developments on the Lake's eastern have cumulatively encouraged motorized activities on Waldo Lake and near its eastern shoreline. Campground facilities and improved roadways have also attracted more visitors to Waldo Lake and consequently may have increased the frequency of motorized disturbances to shoreline visitors. Increased recreation use encouraged by facility developments has cumulatively shifted shoreline setting conditions from a *Primitive* to a *Roaded Natural* recreation experience for visitors at the 22 close-in sites. This shift in setting conditions is most notable on weekends during the 60-day peak-use period. Increased recreation use encouraged by facility developments have gradually shifted shoreline setting conditions at the 29 more distant sites from a *Primitive* to a *Semiprimitive Motorized* experience. Again this shift in setting experiences is most evident during the 60-day peak-use period.

The State of Oregon's cancellation of its fish stocking program has indirectly reduced the number of visitors with motorized boats at Waldo Lake. The State's imposition of a 10-mph boat speed limit has also indirectly suppressed the total number of motorized boaters visiting Waldo Lake. Both regulatory actions have reduced the cumulative effects that motorized boating has on the experiences of visitors at *Semiprimitive* shoreline sites of Waldo Lake. The speed limit has been most effective at moderating motorized boats numbers and maintaining *Semiprimitive* shoreline setting closer to a *Semiprimitive* experience during the 150-day summer season, despite the negative influence that increased recreation use has had over the last 20 years.

Camping closures on islands and in the Charlton fire area have reduced the number of established shoreline sites available for dispersed campers and possibly have increased visitor competition for the remaining sites. Increased site competition could be causing more crowding along the *Semiprimitive* shoreline on the busiest weekends of the peak summer season. These area closures have incrementally shifted setting conditions in the closure areas more toward a *Semiprimitive* experience for day visitors by reducing traffic, and slightly more toward a *Roaded Natural* experience for the remaining shoreline areas that have more crowding. Again, any incremental shift in setting conditions for these affected sites will be most evident during the 60-day peak summer period. The future reopening of the Charlton fire area for shoreline camping within the next 5-10 years would redistribute dispersed campers at Waldo Lake somewhat back toward pre-fire conditions. About half of the fire area sites are within a mile of North Waldo campground (**Figure 3**) and many of the fire closure sites have historically experienced high to moderate use levels.

In addition to the public's use of motors around Waldo Lake, *Semiprimitive* shoreline visitors currently may experience the visual and auditory effects from agency use of chainsaws on the Waldo Lake trail. The Forest estimates trail clearing work with chainsaws requires 3 to 10-days each year depending on the extent of winter storm damage. Trail clearing generally is complete by mid-July, the start of the 60-day peak-use period. About half of these trail maintenance days may also involve the shuttling of trail crews with a 4-cycle motorized boat to western shoreline areas. Because trail work can occur anywhere around Waldo Lake, agency use of chainsaws has the potential to create auditory influences on any of the 51 sites in early summer. Considering the proximity of the Waldo Lake trail to shoreline sites, about 16 sites could potentially subject visitors to visual influences from agency chainsaw use.

The 1998 survey data suggests that less than 20 percent of shoreline visitors are using shoreline sites on Waldo Lake prior to mid-July, when chainsaw use for trail clearing is occurring. Agency use of generators outside of the Waldo Lake campgrounds is uncommon (2-3 times over a 10-year period) and often connected with trail construction projects or repairs to the South Waldo shelter. Agency use of chainsaws and generators on the Waldo Lake trail will continue to have an auditory influence on shoreline visitors whenever it occurs within one mile of occupied shoreline sites. Shoreline visitors affected by agency use of chainsaws and generators on the trail would experience a lower sense of remoteness and solitude that is characteristic of a *Semiprimitive* experience.

Shoreline visitors in August and September are also vulnerable to motor disturbances created by wildfire suppression activities involving chainsaws, helicopters, and possibly 4-cycle motorized boats. During fiscal year 2006, approximately 17 fires were suppressed around Waldo Lake. Seven of these 2006 fires were located within a mile of the Waldo Lake shoreline. Chainsaws were used by fire crews at two of the seven fires for a total of four days in July and August. Chainsaws used for fire suppression within a mile of the shoreline would have the same auditory effects on shoreline visitors as agency trail clearing with chainsaws. Helicopters were used on four fires for a total of 11 days in July and August. Having a similar geographic extent as a floatplane, helicopters would be capable of influencing (visual and auditory) many shoreline visitors during each day of operation. Assuming 2006 is a typical year, motor disturbances from fire suppression activities can be expected each year to disturb at least 12 shoreline sites for 11 days during the 60-day peak-use period. Use of motors for fire suppression would create shoreline conditions more typical of a Roaded Natural setting during their operation.

Shoreline visitors are also annually exposed to the use of motorized boats for water monitoring trips on Waldo Lake. The Forest estimates that a 4-cycle motorized boat is used by various research groups during as many as 5-10 monitoring trips on Waldo Lake each year. Monitoring trips are typically scheduled on weekdays and can take 1-3 days to complete. **Table 4** shows the visual extent of a 4-cycle motorized boat to be greater than its auditory extent. Similar to all public use of motorized boats, these monitoring trips would have more influence on the 22 close-in sites than on the 29 more distant sites. However, disturbance from monitoring trips has the potential to influence any of the 51 shoreline sites if this boat use travels close enough to them.

The Forest does not know of any additional future actions over the next 10 years within the Waldo Lake watershed that would change auditory or visual effects of motor use on *Semiprimitive* shoreline visitors. When considering the above past, present and future actions, Alternative 1 (No Action) would not change current motorized uses or their influence on shoreline setting conditions. Shoreline visitors under Alternative 1 would remain susceptible to disturbance from public and agency use of boats motors, generators, chainsaws, helicopters and floatplanes. Additionally,

visitors to the 22 close-in sites could feel disturbed by motorized uses coming from a nearby campground.

Under Alternative 1, visitors at the 22 close-in sites would experience motorized traffic and disturbance comparable to a *Roaded Natural* setting during the 60-day peak-use period, and similar to a *Semiprimitive Motorized* setting during the remaining 90 days of the season. Visitors at the 29 more remote sites would experience motorized traffic and disturbance comparable to a *Semiprimitive Motorized* setting for much of the 150-day season.

Over the next 20 years, recreation use levels are likely to increase at Waldo Lake in tandem with predicted population growth in Willamette Valley and Central Oregon communities (SCORP 2003). Increases in recreation use under Alternative 1 could produce an incremental shift in motorized disturbance toward a *Roaded Natural* experience at more shoreline sites and over more days of the season. The result of more visitors to Waldo Lake over the next 20 years under Alternative 1 would be a reduced potential for shoreline visitors to experience a *Semiprimitive Nonmotorized* experience at Waldo Lake.

Alternative 2 would reduce the cumulative influences of motor uses on shoreline visitors by prohibiting the loudest boat motors and floatplane visits. Visitors at all 51 dispersed sites would remain influenced by public and agency use of motors during the 150-day season. Alternative 2 would offer the potential for agency use of motors to become more regulated and thereby reduce the effects of this use on shoreline visitors. Alternative 2 would not guarantee that visitors could escape from motor disturbances at their *Semiprimitive* shoreline setting, but would remove two of the most noticeable sources of motor disturbance. Under Alternative 2, visitors could improve their chances of avoiding motorized uses by scheduling their trip outside the 60-day peak-use period and by selecting one of the 29 more distant sites. Projected increases in motorized use over the next 20 years through population growth would gradually shift setting conditions toward a *Roaded Natural* setting at all 51 sites and more frequently compromise the experiences of *Semiprimitive* shoreline visitors.

Alternative 3 would reduce the cumulative influences of motorized uses on shoreline visitors and offer an improved potential of experiencing a *Semiprimitive Nonmotorized* setting compared to current conditions. This improved potential would be most realized during the 60-day peak-use period when the public's use of all internal combustion motors is prohibited. Visitors during this period could still be influenced by the agency's use of boat motors, chainsaws, generators, and helicopters for purposes described above.

Under Alternative 3, visitors to the 22 close-in sites would remain susceptible to motor disturbances from nearby campgrounds throughout the 150-day season. Visitors to all 51 sites would experience less overall disturbance from the public use of internal combustion boat motors during the 60-day peak-use period and shoreline conditions closer to a *Semiprimitive Nonmotorized* setting. Visitors to the 29 more remote sites would notice more incremental change in setting conditions during the 60-day peak period. For the remaining 90 days of the season, Alternative 3 would offer shoreline visitors the same potential to avoid the cumulative disturbances from motor uses described under Alternative 2. Shoreline visitors would remain vulnerable to disturbance from any approved agency use of motors during the 150-day season. Increases in recreation use expected over the next 20 years would create a slower shift in setting conditions during the 60-day peak-use period than expected under current conditions, but a similar rate of change described under Alternative 2 for the remaining 90 days.

Alternative 4 would reduce the cumulative influences of motor uses on shoreline visitors by removing the public's use of internal combustion motors for the entire 150-day season. Visitors would have more days under Alternative 4 than current conditions to seek out the remoteness and solitude of a *Semiprimitive Nonmotorized* setting. Visitors to the 22 close-in sites would remain susceptible to motorized activities in nearby campgrounds, and all site visitors would retain the same disturbance potential created by any approved agency use of motors described under Alternative 3. Visitors to the 29 more remote sites would experience less cumulatively motor disturbance throughout the 150 day season. Alternative 4 would offer shoreline visitors a higher cumulative potential to enjoy a *Semiprimitive Nonmotorized* experience than current conditions offer. Projected increases in recreation use over the next 20 years would have less negative influence on shoreline setting conditions and visitors throughout the 150-day season than expected under current conditions.

Finally, Alternative 5 would offer shoreline visitors the most comprehensive reduction in motor disturbances by removing all public use of motors on Waldo Lake and its *Semiprimitive* shoreline for the entire 150-day season. By also removing the public use of electric boat motors, Alternative 5 would be promoting *Semiprimitive Nonmotorized* setting conditions for shoreline visitors. Shoreline visitors under Alternative 5 would still remain vulnerable to the same disturbances from any approved agency use of motors described for Alternatives 3 and 4. Under Alternative 5, projected increases in recreation use over the next 20 years would have less negative influence on shoreline setting conditions and visitors throughout the 150-day season than under current conditions or other action alternatives.

In conclusion, the potential to offer a *Semiprimitive Nonmotorized* experience to shoreline visitors at Waldo Lake would be improved by all action alternatives compared to current conditions. The largest incremental improvement to this potential across the 150-day season is offered by Alternatives 4 and 5. Alternative 3 offers a similar potential for improving shoreline setting conditions, but only during the 60-day peak-use period. When recognizing that more than 80 percent of the visitation occurs during the 60-day peak-use period, the absolute differences by Alternatives 3 and 4 in creating the setting benefits for shoreline visitors may not be substantial.

## **Public Access to Waldo Lake**

### **Affected Environment of Public Access**

Beyond the travel convenience they provide boaters, boat motors offer access opportunities for some Waldo Lake visitors. Visitors with mobility constraints related to age or disability rely on boat motors to recreate on water bodies like Waldo Lake. Owners of large boats (greater than 18 feet) also rely on a boat motor(s) to travel on Waldo Lake. Even owners of large sailboats have expressed a need for auxiliary motor power to maneuver in and out of boat launches at Waldo Lake. Finally, floatplane operators occasionally use Waldo Lake as a recreation destination. **Table 6** summarizes proposed changes to public lake access with motors by alternative.

### **Direct and Indirect Effects to Public Access**

Alternative 1 (No Action) creates no change in the public's use of motors to recreate on Waldo Lake. Visitors would retain existing freedoms to use any boat motor they preferred within the confines of the current boat speed limit. Floatplane operators would also be free to land on and take off from Waldo Lake within the limits of FAA regulations.

**Table 6:** Lake Access (number of days) for Motorized Boaters and Floatplane Operators by and Alternative.

Visitor Type	Alt 1 (No Action)	Alt 2	Alt 3	Alt (Preferred)	Alt 5
2-cycle Motor Boaters	150	0	0	0	0
4-cycle Motor Boaters	150	150	90	0	0
Electric Motor Boaters	150	150	150	150	0
Floatplane Operators	150	150	0	0	0

Alternative 2 introduces only one new motor restriction: a ban on 2-cycle internal combustion motors throughout the 150-day summer season for boating visitors to Waldo Lake. Motorized boaters would be restricted to 4-cycle or electric boat motors on Waldo Lake, in addition to having to obey the current speed limit. With this new motor restriction, Alternative 2 would likely not change the types of boat access available to visitors on Waldo Lake. The 1998 user survey results suggest a 2-cycle motor restriction would affect 65.1 percent of motorized boaters at Waldo Lake. These boaters could retain their lake access by investing in a 4-cycle or electric motor. As such, Alternative 2 could reduce lake access only for boaters with 2-cycle motors that felt they could not afford to purchase a 4-cycle internal combustion or electric motor. Further discussion of this subset of visitors can be found in the Financial Costs for Motorized Boaters and the Environmental Justice for Minority Populations and Low Income Populations issue sections.

Alternative 3 changes public access options on Waldo Lake by prohibiting all internal combustion boat motors, as well as the use of generators at dispersed sites, during a 60-day peak-use period in late summer. Alternative 3 would allow visitors to use 4-cycle or electric boat motors, as well as generators at dispersed sites, during the remaining 90 days of the summer season. Alternative 3 basically retains the same boat motor options as Alternative 2, but restricts the use season for internal combustion motors to 90 days. Boaters with internal combustion motors could retain their season of use under Alternative 3 by investing in an electric motor in order to visit during this peak summer period. The 1998 visitor survey showed that less than five percent of boaters with internal combustion motors already possessed electric motors.

Alternative 3 could also indirectly restrict dispersed site selection during the 60-day peak summer period for boaters with electric motors by prohibiting their use of generators for recharging batteries at shoreline sites. During this 60-day peak summer period, boaters with electric motors would need a solar panel at their shoreline site or to return to a boat launch for recharging their battery. This constraint during the peak-use period could compel these boaters to select shoreline sites closer to a boat launch than previously. The 1998 visitor survey found only 20 percent of dispersed site campers used a motorized boat. While the 1998 visitor survey showed only 9.3 percent of motorized boaters used electric motors, Alternative 3 would likely increase the use of electric boat motors on Waldo Lake over time.

Alternative 3 would also eliminate year-round access to Waldo Lake for floatplane operators. District experience over the past ten years suggests that floatplane visits to Waldo Lake during the summer season are uncommon (2-3 events per summer) but notable when they occur.

Alternative 4 would reduce public access options for a variety of Waldo Lake visitors by prohibiting all internal combustion motors over the entire 150-day recreation season. Through its motor restrictions, Alternative 4 would reduce independent boating access for visitors with physical limitations, who would need to rely on others (friends, family, and outfitter/guides) to travel on Waldo Lake. Alternative 4 would also require owners of large boats (greater than 18 feet) who felt that electric boat motors could not serve their boating needs to change their boating options. Owners of large sailboats particularly have expressed this concern over the adequacy of electric motors. The 1998 visitor survey found sailboaters represented 32.5 percent of motorized boaters and 4.9 percent of all boaters (Appendix B). Most sailboats in the 1998 survey (90.3 percent) were equipped with an auxiliary motor.

By restricting use of generators at dispersed sites for the entire 150-day season, Alternative 4 could also change access to some shoreline camp sites for visitors using electric boat motors and needing to recharge their marine batteries. Such visitors would either have to stay in a campground or return to a boat launch to recharge their batteries. Other boaters with electric motors could transition to solar panels as a recharging option for their batteries. Finally, Alternative 4 would remove floatplane access to Waldo Lake year-round.

Alternative 5 creates the greatest change to lake access by restricting public's use of all boat motors for the entire 150-day summer season. Lake visitors would be required to travel on Waldo Lake in nonmotorized craft. This change would affect travel options for 13.4 percent of the current boating population. Visitors with physical limitations that preclude nonmotorized travel would have to rely on others for traveling on Waldo Lake. Most owners of large boats would lose lake access with their boats. Most owners of large sailboats would likely not sail on Waldo Lake with their boats rather than attempt to navigate the boat launches and shallow bays without an auxiliary motor. Similar to Alternatives 3 and 4, Alternative 5 would also eliminate lake access for floatplane operators throughout the year.

### **Cumulative Effects to Public Access**

The geographic scope for assessing the cumulative effects of this issue is Waldo Lake. Past and present improvements to roads and facilities have increased public access to a previously remote and unregulated dispersed setting. The boat speed limits indirectly reduced access for some boaters (e.g. water skiers, jet skis, and speed boaters) by removing their incentives for visiting this lake. The recent EPA regulation on air emissions from internal combustion engines will eventually reduce consumer access to conventional 2-cycle boat motors. Alternative 1 (No Action) does not change boating access or travel options for visitors at Waldo Lake. Alternative 2 also does not change boating access for lake visitors, though it reduces the types of boat motors allowed.

Alternatives 3, 4 and 5 all further reduce motorized boater and floatplane access to Waldo Lake by either prohibiting the types of boat motors allowed or by reducing the season of access. Such incremental changes to boater access stand in contrast to the recreation facilities first constructed in 1971 and recently upgraded in 2004. However, reduced access under these alternatives are compatible with the boat speed limit imposed by the State of Oregon in 1973, the designation of most of the shoreline as a Dispersed Recreation, Semiprimitive Nonmotorized management area in 1990, and the 1996 EPA regulations on boat motors to reduce air emissions from recreational motors.

### **Costs for New Management Strategies**

#### **Affected Environment of Costs for New Management Strategies**

The Forest Service costs for implementing new motor restrictions proposed by the action alternatives are not expected to be high in absolute terms, but could represent 8- 14 percent of anticipated recreation funding at the Middle Fork Ranger District for recreation programs. In fiscal year 2005, the Middle Fork Ranger District was allocated \$114,000 for recreation programs, \$41,000 for wilderness programs and another \$37,000 for trail maintenance. Within the 2005 recreation program, the Middle Fork Ranger District allocated approximately \$33,000 for managing dispersed recreation across the District.

This proposed action would not create new funding sources for implementing changes at Waldo Lake, but would require the District to direct more existing funding toward Waldo Lake and away from other dispersed recreation sites on the District. This proposed action would not affect funding directed at managing campgrounds, wilderness areas, or trails.

### Direct and Indirect Effects to Costs for New Management Strategies

Alternative 1 (No Action) continues existing visitor education and dispersed site maintenance and monitoring around Waldo Lake. This workload costs the District approximately \$5600 every year. Historically the Middle Fork Ranger District has assigned two seasonal employees to periodically clean dispersed sites around the lake from July 15<sup>th</sup> to September 30<sup>th</sup>. During these site visits field patrols may talk with visitors who are engaged in non-compliant activities. Such compliance checks are most frequent during late summer fire closures. Field patrols also evaluate the physical condition of known dispersed sites every three to five years. The cost of site maintenance and monitoring work is approximately \$3600 per year. Under Alternative 1 (No Action), visitor education efforts focus on appropriate camping behavior and the uniqueness of Waldo Lake. This public outreach costs approximately \$2000 per year. Enforcement of the existing 10 mph speed limit on Waldo Lake is assigned to the Lane County Sheriff through funding by the Oregon State Marine Board.

**Table 7** describes estimates for new regulations on boat motors, generators and chainsaws under each action alternative. Cost estimates would likely reduce after the third year of implementation when start-up costs are expected to disappear. After five years of implementing new regulations, enforcement costs could also decline for some alternatives as the public comes to understand and accept the new use regulations. The 2003 visitor survey (Appendix H) found almost 75 percent of surveyed visitors at Waldo Lake were repeat visitors. A high proportion of repeat visitors should improve the District's efforts to educate visitors about new regulations.

**Table 7:** Increases in Annual Dispersed Recreation Management Costs for Waldo Lake by Alternative

Cost Elements	Alt 1 (No Action)	Alt 2	Alt 3	Alt (Preferred)	Alt 5
Admin/Maintenance	\$3600	\$ 4600	\$ 5600	\$ 5600	\$ 5600
Education	\$2000	3000	3000	3000	3000
Start-up*	0	6500	8500	7500	7500
Enforcement	0	1000	4000	3000	2000
Total	\$5600	\$15,100	\$21,100	\$19,100	\$18,100

\* Includes costs for sign prep and installation, and public relations efforts to initiate changes.

All action alternatives would increase administrative workload and operating costs to implement new management strategies regarding motorized boats. The District also would incur more costs under Alternatives 3, 4 and 5 to educate visitors about restrictions on chainsaw and generator use at dispersed sites. Additional costs for implementing restrictions on floatplane access to the lake are not expected to be notable, primarily involving the publishing of the new regulation with the Federal Aviation Administration (FAA) and sending notices to regional associations of floatplane operators. Cost estimates assume low levels of vandalism on regulatory signing at boat launches due to the presence of campground hosts. Signing about boat motor restrictions placed near the junction of Forest Road 5897 and State Highway 58 would be most vulnerable to vandalism. In general, new motor restrictions would initially cost \$9,500-\$15,500 per year more than current costs (Alternative 1) depending on alternative selected.

Alternative 2 is the least expensive action alternative because it creates fewer restrictions on Waldo Lake visitors. The main management focus for this alternative would be educating boaters and installing signs about the prohibition of 2-cycle boat motors. For the first three years, Alternative 2 would increase management costs at Waldo Lake by \$9500. After the third year of new restrictions start-up costs disappear, and Alternative 2 would add only \$3000 per year to dispersed recreation management costs.

Alternative 3 proposes the most expensive motor restriction strategy due to the complexity of managing a seasonal restriction. Even after a two-year transition period to educate the public about these changes, Alternative 3 is most likely to cause confusion among visitors and to create a greater need for enforcement action during the first five years of implementation. Even after five years of implementation, Alternative 3 enforcement costs would likely remain high.

Alternatives 4 and 5 create similar costs for implementing a complete ban on internal combustion motors throughout the 150-day recreation season. A total ban on internal combustion boat motors should be easier to communicate with visitors and enforce than a seasonal motor ban. Alternatives 4 and 5 would still increase administration and law enforcement costs from current conditions, because they impose total bans on internal combustion boat motors on the lake, as well as generators and chainsaws at dispersed sites. By allowing public use of electric boat motors, Alternative 4 would likely increase enforcement costs slightly more than enforcing a total motor ban, because it would allow boats with both electric and internal combustion motors to travel on Waldo Lake (under electric power) and give these boaters potential opportunities to violate the motor restriction.

Alternatives 2, 3 and 4 should produce few enforcement problems with proposed motor restrictions during the first five years by giving boaters two years to transition to 4-cycle or electric motor technology. By contrast, Alternative 5 has potential to create more boater non-compliance by implementing motor restrictions immediately. The small number of dispersed site campers using chainsaws or generators (estimated at less than 10 percent) suggests that enforcement costs for restricting these motors at dispersed sites would be negligible after the first three years of implementation.

Additional management costs under any of the action alternatives represent less than 15 percent of the District's total recreation budget, and therefore would have limited effect on recreation services or facilities across the District over the next 10 years. All action alternatives could indirectly influence the District's recreation program by rescheduling its work force in order to maintain a greater staff presence at Waldo Lake. Any personnel shift to Waldo Lake would create small reductions in facility maintenance and enforcement efforts at other locations. Such changes in personnel presence would only affect recreation sites managed by the Forest Service, not sites

managed under a concessionaire contractor. Funding and personnel shifts would be most apparent during the two year phase-in period for motor restrictions, when start-up expenditures are incurred.

### **Cumulative Effects of Costs for New Management Strategies**

The scope of cumulative effects for this issue is the recreation program budget for the Middle Fork Ranger District. Budgets allocated to each of the ranger districts on the Willamette National Forest are based on a complex formula that considers such criteria as acres to manage, numbers of facilities, numbers of recreation visitors, and special designation areas. The proposed action would not change these criteria in any substantive way and therefore would not change the distribution of funding among the ranger districts. For this reason, the scope of cumulative effects for this issue will be limited to the Middle Fork Ranger District.

Over the past three to four years, federal funding for recreation programs has declined on the Willamette National Forest by as much as 20-30 percent annually. This budget trend is expected to continue. Within the next five years, the Middle Fork Ranger District expects to decommission developed sites or reduce services at low occupancy developed sites to help mitigate lower budgets and to shift funding to deferred (backlog) facility maintenance at its high occupancy sites.

Cumulatively, the increased management costs of implementing the action alternatives at Waldo Lake would not change the District's total expenditures on recreation programs. As stated above, increased management costs at Waldo Lake would simply reduce services and staffing at other recreation sites on the District. The consequence of redirecting funding to Waldo Lake would be a commensurate increase in total deferred maintenance at other recreation sites across the District. No other cumulative effects for this issue are anticipated.

### **Equipment Costs for Motorized Boaters**

#### **Affected Environment of Equipment Costs for Motorized Boaters**

**Table 8** summarizes cost estimates for new equipment that motorized boaters may have to invest in under the proposed action (or its alternatives) in order to continue their boating activities on Waldo Lake. New 4-stroke gas motors can range in price from \$1200 to \$2200 *msrp* for models in the 5 to 15 horsepower range (sources: [www.iboat.com](http://www.iboat.com), 2006 Cabela's catalog). New electric motors with sufficient thrust (2 to 9 hp equivalents) for the range of boats that typically visit Waldo Lake would cost \$450 to \$1800. A triple-motor electric model offering 165 lbs thrust (11 hp) was recently listed for \$1800 (Cabela's 2006 catalog) and rated for boats up to 8000 lbs (approx. 16-24 foot lengths). A more uniquely designed electric motor intended for pushing large boats for extended periods was listed at \$4600 ([www.rayco.com](http://www.rayco.com)).

Marine batteries for electric motors range from \$150 to \$250 depending on amperage and reserve capacity. Some motorized boaters already have marine batteries. Boaters choosing to use an electric boat motor may also want to invest in a battery charger (\$65-120) or a portable generator (\$500-\$750) to recharge batteries during multi-day visits. Finally, solar chargers for marine batteries are available as an alternative to generators and list for less than \$200 per panel.

**Table 8:** Cost Comparison of New Boating Equipment for Boaters by Alternative

Equipment	Alt 1 (No Action)	Alt 2	Alt 3	Alt 4 (Preferred)	Alt 5
4-cycle Motor (2-15 hp)	\$ 0	\$ 1200-2200	\$ 1200-2200	\$ 0	\$ 0
Electric Motor (55-165 lbs)	\$ 0	\$ 450-1800	\$ 450-1800	\$ 450-1800	\$ 0
Marine Battery (24 volt)	\$ 0	\$ 150-250	\$ 150-250	\$ 150-250	\$ 0
Battery Charger (portable)	\$ 0	\$ 65-120	\$ 65-120	\$ 65-120	\$ 0
Gas-Powered Generator	\$ 0	\$ 500-750	\$ 500-750	\$ 500-750	\$ 0

### Direct and Indirect Effects to Equipment Costs for Motorized Boaters

Alternative 1 (No Action) creates no new financial costs for motorized boaters using Waldo Lake. Boaters would continue using Waldo Lake without incurring additional equipment costs required by new restrictions.

Alternatives 2 and 3 would require boaters with 2-cycle motors to purchase another motor technology if they wished to travel by motor on Waldo Lake and did not already have this equipment. Purchasing a new 4-cycle motor is estimated to cost between \$1200 and \$2200 *msrp* for sizes ranging from five to 15 horsepower (hp). Used boat motors are also available and cheaper. This cost for a 4-cycle motor would be slightly offset over time by the increased fuel efficiency of 4-cycle technology compared to most 2-cycle motors. Motorized boaters under Alternatives 2 and 3 could also invest in electric motor technology to replace their 2-cycle motors. Electric motors with a marine battery would cost between \$600 and \$1050. These boaters may also choose portable equipment for recharging their battery(s) which could cost an extra \$500-\$750.

The 1998 visitor survey found that boaters using 2-cycle gas motors comprised about 8.8 percent of all surveyed boaters, and boaters were 40 percent of the total Waldo Lake survey population. An more accurate understanding of the scale of financial costs created by banning 2-cycle gas motors was determined by estimating the number of boaters in the survey population visiting Waldo Lake more than once a year. Road counters on the Waldo Lake road registered 9925 vehicles in 1998 from June 21<sup>st</sup> to October 4<sup>th</sup>. Assuming maintenance and non-lake vehicle traffic represented 12 percent of total traffic counts in 1998, and knowing that the survey showed 81 percent of Waldo Lake visitors made only one trip that year, the 1998 survey data suggests about 251 different boaters used a 2-cycle internal combustion motor on Waldo Lake in 1998. These are boaters that could need to invest in 4-cycle or electric boat motor technology in order to continue motorized boating on Waldo Lake under Alternatives 2 and 3.

Alternative 4 restricts motorized boating on Waldo Lake to electric motors only. The 1998 survey data showed only 3.5 percent of surveyed boaters used 4-cycle internal combustion motors. Using

the same assumptions made above for Alternatives 2 and 3, Alternative 4 would require as many as 99 different boaters with 4-cycle motors to invest in an electric motor to continue motorized boating on Waldo Lake. These boaters would be in addition to the 251 boaters with 2-cycle motors that Alternative 4 also forces to consider an electric motor investment. The 1998 survey found less than 5 percent of boaters with internal combustion motors already had electric auxiliary motors on their boats, therefore Alternative 4 would cause at least of 333 boaters to consider an investment decision for an electric motor.

Electric motors can cost from \$450-\$1800 for 2- to 9-hp power equivalents. Boaters choosing an electric motor option may also need a recharging system (a portable generator or solar panel) if they plan to run their boat motors for extended periods (more than one day) on Waldo Lake. Recharging devices would cost as much as \$750 for a portable generator or \$200 for a small solar panel.

Alternative 5 would not create additional financial costs for boaters to invest in new motor technology or power sources, because it would prohibit all boat motors on Waldo Lake.

### **Cumulative Effects of Equipment Costs for Motorized Boaters**

Cumulative effects for this issue are assessed within the population of motorized boaters using Waldo Lake. Motorized boaters incur operating costs in the form of annual state registration fees (less than \$120 for boats less than 40 feet), boat insurance (varies by boat size and type), fuel (currently over \$3 per gallon), personal floatation equipment (\$100-250 for 4 people), and the initial purchase price of their boat, motor(s) and trailer (\$2000-30,000).

Additional costs incurred by boaters at Waldo Lake include campground fees (\$15 per day) or Northwest Forest Pass parking fees (\$5.00 per day) at boat launch parking areas. These site fees are similarly charged to visitors at many other lakes or reservoirs in the region and will likely increase slightly over the next ten years.

Alternatives 1 (No Action) and 5 create no new financial obligations to change the cumulative financial costs for Waldo Lake visitors wishing to continue their boating activities.

Alternatives 2, 3 and 4 would increase the cumulative costs for visitors wishing to continue their motorized boating activities at Waldo Lake. The incremental cost increase could be as high as \$2200 for a new 10hp four-cycle motor and as low as \$600 for an electric motor with a solar panel and battery. Such transitional motor costs would be one time expenses that would be amortized over 10 years of recreation. For a visitor that spends two long weekends at Waldo Lake each year, the cumulative costs incurred by Waldo Lake regulations over 10 years under the action alternatives could be as high as \$2380 (\$2200 for new motor plus \$180 for camping fees) or \$238 per year.

The new EPA air emissions standards will influence future purchases in new motors for visitors looking to replace their old 2-cycle boat motors. Such visitors will soon find it necessary to purchase a more expensive 4-cycle or fuel-injected 2-cycle motor, because manufacturers will no longer offer standard 2-cycle boat motors. For these boaters, Alternatives 2, and 3 may simply accelerate the economic cost of they would incur over the next ten years.

## Other Issues

### Local Communities and Economies

#### Affected Environment of Local Communities and Economies

Regardless of their trip plans, travelers on State Highway 58 contribute to the economies of local communities (e.g. Oakridge and Crescent Lake) near southern end of the Willamette National Forest. Waldo Lake is a major recreation attraction along the Highway 58 corridor, despite its short use season, low fish populations, and current 10 mph speed limit for boaters. But Waldo Lake is still only one of many public recreation opportunities along the Highway 58 corridor, and National Forest recreation is only one of the reasons people travel through these local communities on Highway 58.

#### Direct and Indirect Effects to Local Communities and Economies

Action alternatives could have some influence on the types of visitor activities at Waldo Lake due to their proposed restrictions on boat motors, floatplanes, generators and chainsaws. These proposed restrictions however, are not likely to create a substantial change to the total number of visitors at Waldo Lake or to the total flow of travelers contributing to the economies of local communities along the Highway 58 corridor.

Motorized boaters at Waldo Lake, approximately 13.6 percent of surveyed boaters and 5.4 percent of all surveyed lake visitors in 1998, would be most affected by proposed restrictions under the action alternatives. Action alternatives would directly displace some motorized boaters to other locations by imposing seasonal or year-round restrictions on boat motors. Estimates from 1998 survey results suggest that fewer than 300 boaters used motors as their power source while visiting Waldo Lake. Minimally, Alternatives 2 and 3 could displace those motorized boaters unwilling to transition from their 2-cycle motors to 4-cycle or electric motors. Some of these boaters would simply choose other water bodies off of Highway 58 (e.g. Crescent Lake, Odell Lake) or in the central Cascade Mountains.

By imposing a seasonal motor restriction at Waldo Lake, Alternative 3 could shift boaters with 4-cycle motors to days outside the 60-day peak-use period (July 15 to early September) or displace them to other water bodies.

Alternatives 4 would displace most motorized boat use from Waldo Lake by prohibiting all internal combustion boat motors for the entire 150-day recreation season. Affected boaters could choose to use an electric motor to continue their recreation behavior at Waldo Lake, or recreate at another water body. By also restricting electric motors, Alternative 5 would displace all boaters with motors to other lakes or force them to use paddle boats on Waldo Lake.

Action alternatives are not expected to substantially change the total number of annual visitors at Waldo Lake or to impact local economies due to a displacement of boaters. Action alternatives would change the types of boats at Waldo Lake, but not the total number of boaters or overall visitors during a typical recreation season. It's important to remember that the 1998 survey showed motorized boats represented about 13.6 percent of all boaters and only 5.4 percent of total surveyed visitors to Waldo Lake.

In summary, any visitor displacement caused by action alternatives would likely affect a fraction of the total recreation traffic along the Highway 58 corridor, and therefore would have little effect on the economies of local communities along this highway corridor. Finally, the recreation setting and opportunities around Waldo Lake can be expected to consistently pull in a high number of visitors each year regardless of the motor restrictions proposed by this proposed action. Many of these visitors will be traveling through one of the Highway 58 communities.

### **Cumulative Effects to Local Communities and Economies**

The geographic scope for assessing the cumulative effects of this issue is the Highway 58 corridor within 100 miles of Waldo Lake. A combination of population growth in the Willamette Valley and Central Oregon, tourism industry growth, and Highway 58 improvements have combined to increase recreation traffic traveling through local communities around Waldo Lake. Highway improvements have also made Highway 58 a major commercial travel corridor over the Central Cascade Mountains. These past and present changes in traffic patterns have provided an economic base for communities like Oakridge. Future population increases forecast for the Willamette Valley and Central Oregon should create more commercial and recreational traffic through these rural communities on Highway 58.

Motorized restrictions proposed by the action alternatives would create only small changes in total recreation traffic at Waldo Lake, because affected visitors (i.e. motorized boaters, floatplane pilots, and users of generators/chainsaws) represent a small percent of total Waldo Lake traffic and Waldo Lake traffic is a minor component of total highway traffic. Therefore implementing one of the action alternatives would have no measurable effect on Highway 58 traffic over an average summer season. In summary, motor restrictions under the action alternatives would not change how Waldo Lake recreation traffic contributes to the cumulative economies of local communities near Waldo Lake.

## **Environmental Justice for Minority and/or Low Income Populations**

### **Affected Environment of Environmental Justice**

Executive Order 12898 (February 11, 1994) requires an analysis of federal actions to determine if there is a “disproportionately high and adverse effect” on minorities (Asian Americans, African Americans, Hispanics), low-income populations, American Indians or subsistence users. The principle behind environmental justice is that minority and low-income citizens should not experience a disproportionate level of adverse impacts or derive fewer benefits, relative to the dominant segments of society, from federal actions.

The 1998 visitor survey at Waldo Lake demonstrated that a majority of lake visitors come from Lane and Deschutes Counties, which have minority populations of 9.4 percent and 5.2 percent, respectively. Waldo Lake is located near the Cities of Oakridge and Westfir in Lane County, Oregon; Crescent Lake, Crescent, and Gilchrist in Klamath County; and La Pine in Deschutes County. These Lane County communities have minority populations of seven percent and less than one percent, respectively. Communities in the southern Deschutes County possess minority populations averaging 4.3 percent. The above Klamath County communities have minority populations of 5.8 percent and minorities represent 12.7 percent for the entire county population (U.S. Census Bureau, 2000).

Approximately 14.5 and 12.2 percent of the Oakridge and Westfir populations, respectively, are at or below the poverty level (U. S. Census Bureau, 2000), which compares to 15.6 percent for the greater

Eugene-Springfield area. Similarly, northern Klamath County communities have 14.0 percent of their populations with incomes at or below the poverty level. Comparatively, Bend and La Pine in Deschutes County have 9.9 percent and 13.2 percent, respectively, of their populations with incomes at or below the poverty level. (U.S. Census Bureau, 2000).

Subsistence and cultural use levels in the Waldo Lake watershed are difficult to quantify and differential patterns of subsistence consumption between population subgroups are unknown at this time. However, the Forest historically has provided public access to firewood near roads, mushrooms and other consumables through a personal-use permit system. Middle Fork Ranger District records for 2002 show permits were awarded for: 829 cords of firewood; 2,057 Christmas trees; and 490 personal-use mushroom gathering (per Gary Marsh, Middle Fork Ranger District employee). For such forest products, the Waldo Lake watershed has not received a high level of interest from the public. A recent exception might be mushroom gathering for morels within the Charlton fire area.

As stated previously, the Willamette National Forest has government-to-government relationships with four tribal organizations through Memorandums of Understanding (see Public Involvement section). These relationships provide an avenue for tribal governments to express concerns to the Forest about any effects on traditional cultural properties and prehistoric resources.

### **Direct and Indirect Effects to Environmental Justice**

Action alternatives would not affect the distribution of minority and low-income community members living within watersheds or communities around Waldo Lake. Action alternatives also would not preclude minority or low-income community members from recreating at Waldo Lake, and would apply proposed recreation restrictions equally to all visitors at Waldo Lake.

Boat motor restrictions proposed by Alternatives 2, 3 and 4 could disproportionately affect local, low-income people wishing to operate 2-cycle motorized boats on Waldo Lake. These residents would likely have more difficulty reinvesting in a 4-cycle or electric motor, and such an investment can be expected to economically affect low-income residents more than others (see Financial Costs of Boaters section). Low-income residents with motorized boats are also more likely to own a 2-cycle boat motor because these models are less expensive.

The Forest does not know what percent of annual boaters at Waldo Lake have incomes at or below the poverty levels. The remoteness of Waldo Lake and associated travel costs coupled with access to other boating options near the surrounding communities help support the District's belief that low-income residents make up a small percent of Waldo Lake visitors. There are many large lake recreation options within 100 miles of Waldo Lake that are close to the local communities mentioned above in surrounding counties. Large lake and reservoir options in Lane County include Fern Ridge, Fall Creek, Blue River, Cougar, Dexter, Lookout Point, Hills Creek, Dorena, and Cottage Grove Reservoirs. Similar options in Klamath County include Odell, Diamond, Crescent and Klamath Lakes. Similar options in Deschutes County include Crane Prairie and Lake Billy Chinook reservoirs, as well as the smaller Davis Lake. These water bodies offer opportunities for residents of these three counties to operate 2-cycle internal combustion motor boats without requiring them to reinvest in new motor technology.

No action alternative would not affect Native American/Indian rights (e.g. hunting, gathering, religious) recognized by the Federal government, and would not reduce access to known areas used by Native Americans for their traditional cultural properties. Action alternatives would not

disproportionately affect subsistence users foraging or hunting around Waldo Lake more than other visitors to the watershed.

### **Cumulative Effects to Environmental Justice**

The cumulative effects of this issue would be considered for the residents from counties immediately surrounding Waldo Lake. Cumulative effects from the proposed action on low-income, minority, and Native American residents, as well as on subsistence users would be the same as those direct and indirect effects described above. In summary, the cumulative effects on these subsets of the population would be the added costs assumed by boaters that choose to purchase newer boat motor technologies in order to comply with new motor restrictions.

## **Issues Required by Regulation**

### **Proposed, Endangered, Threatened, or Sensitive Plant Species (PETS)**

Effects to PETS plant species have been assessed and are described in the Botanical Biological Evaluation (Appendix I). A number of sensitive species are known to exist within the Waldo Lake watershed; however, few known sites have direct contact with visitors Waldo Lake's shoreline.

A population of northern bog club moss (*Lycopodiella inundata* L.) has been found at the north end of Waldo Lake near a popular dispersed campsite (Dam Camp) and part of the Waldo Lake shoreline trail. Habitat for this club moss is located in wet meadows near the lakeshore and small ponds within the watershed. The known population near Dam Camp is vigorous and does not appear to show trampling impacts from recreation use. Current mitigation at this site includes instructing groups using Dam Camp under special use permit how to avoid this known population site. Annual monitoring at the site will help determine the need for further mitigating measures against demonstrated visitor impacts. These species will not be discussed further in this analysis document.

A nonvascular moss (*Schistostega pennata*) has also been located in wet sites southeast of Waldo Lake. Two of these sites are adjacent to the Waldo Lake trail, but no sites have been found near any 51 shoreline dispersed sites. Similar habitat for this species can be found elsewhere within the watershed. This species will not be discussed further in this document.

Two coral fungi species (*Ramaria amyloidea* and *R. aurantiiscescens*) have been located in mixed conifer habitat on the west side of the lake. Fungal species can be affected by localized soil compaction and the felling of trees that are mycorrhizal host species. These species have not been located near dispersed campsites or other areas of concentrated use; however potential habitat is currently being used for camping and hiking around Waldo Lake. These species will not be discussed further in this analysis document.

A rare aquatic liverwort (*Jamsoniella autumnalis* var. *Heterostipa*) is known to grow abundantly within deep-water mats of liverworts and mosses on the lake floor. These bryophytes are specifically adapted to growing in conditions of low light, low nutrient concentrations, and cold water temperatures. While not on the protected species (PETS) list, this species has attracted interest from scientists to study these deep-water mats in Waldo Lake. Recreation use around and on Waldo Lake could influence water clarity and ultimately decrease light penetrating to these deep water colonies. To date, water quality sampling in Waldo Lake has not found a connection between human use in the subwatershed and variations in water clarity samples. Water sampling results for

2004 were higher than results from previous sample years and have demonstrated water clarity conditions comparable to Crater Lake. This species will not be discussed further in this analysis.

None of the species identified above will be impacted by the management changes being considered in this analysis.

### **Survey and Manage Species**

This proposed action does not include any ground-disturbing activities that would affect habitat for Survey and Manage species in the Waldo Lake basin (Appendix F) and is therefore in compliance with the 2001 Record of Decision for Survey and Manage Species (USDA 2001). This proposed action could indirectly reduce visitor impacts to suitable habitat for some Survey and Manage species by restricting the public's use of chainsaws at dispersed recreation sites around Waldo Lake. These potential effects on snag habitat will be discussed separately.

A semi-aquatic liverwort (*Marsupella emarginata* var. *aquatica*) is a Survey and Manage species found in the outlet channel near Dam Camp at Waldo Lake. It has been found growing on submerged rocks intermittently in the first two miles of the outlet stream, particularly in fast-moving stream reaches. Monitoring of this *M. emarginata* v. *aquatica* site has not found signs of substantial impacts from recreation visitors. Water pollution and unrestricted recreation use around this site could threaten this population in the future. Monitoring of this population will be continued into the future to determine the need to divert recreation use away from the outlet channel site. This species will not be discussed further in this analysis document.

Because this proposed action would not affect habitat for Survey and Manage Species beyond potential benefits caused by prohibiting public use of chainsaws on the shoreline, this issue will not be discussed further in this document.

### **Heritage Resources**

Based on conversations with local tribal organizations conducted for previous projects on the Middle Fork Ranger District, the Forest consulted with four tribal organizations whose member tribes could have historic ties to the Waldo Lake Basin to understand their issues and concerns around this proposed action. These tribes were also invited to participate in the Waldo Subcommittee process in 2000-01. From these contacts, tribal representatives from the four tribal organizations raised no issues regarding potential effects to prehistoric use or traditional cultural properties.

This proposed action would not affect the availability of or access to traditional cultural properties within the Waldo watershed by tribal members. A 2005 letter of concurrence with the Oregon State Historic Preservation Office (Appendix G) is filed in the analysis records at the Middle Fork Ranger District. This issue will not be discussed further in this analysis document.

### **Management Indicator Species**

Implementation regulations for the National Forest Management Act of 1976 (NFMA) require the management of wildlife habitat to "maintain viable populations of existing native and desired non-native vertebrate species in the planning area" (page III-68, USDA. 1990a).

Management Indicator Species (MIS) identified in the Forest Plan to facilitate management of wildlife habitat are summarized in the FEIS (page III-69, USDA. 1990a) for the Forest Plan. The

analysis area does not contain winter range habitat for deer and elk, cliff habitat for peregrine falcons, or potential water habitat for anadromous fish species. Anadromous fish and resident fish species are discussed separately under the “Protected and Native Fish Species” issue.

Habitat features for northern spotted owls, pileated woodpeckers, pine martens, cavity excavators, and bald eagles were found to occur within the analysis area. Bald eagles are discussed under the “Bald Eagle Nest Sites” issue. This proposed action does not create any direct effects on old growth snag habitat features important to northern spotted owls, pine martin, pileated woodpecker, and other cavity excavators. This proposed action could indirectly affect snag habitat used by these species by prohibiting the public’s use of chainsaws around the lake shore. Effects on snag habitat are discussed as a separate issue. Management Indicator Species will not be discussed further in this analysis document.

## Proposed Action Monitoring

Monitoring elements specific to this proposed action will only be designed to determine visitor compliance with selected motor restrictions. Compliance monitoring would most often occur at boat launches and during routine recreation patrols around the shoreline by field staff visiting dispersed campsites.

Ongoing monitoring efforts unrelated to this proposed action but connected with Forest Plan management objectives for protected species (e.g. Bald eagle nest sites, known sensitive plant sites) will continue to occur at Waldo Lake. Periodically, field staff will also make assessments of visitor impacts at shoreline dispersed campsites to determine the effects that visitors are having on vegetation and soil, and to document where new campsites have been established.

Other unrelated monitoring efforts will be on-going at Waldo Lake to collect scientific data (e.g. water quality, climate). A coalition of resource specialists from various agencies has designed long-term monitoring for physical and chemical characteristics in the watershed. Resource specialists will also conduct periodic assessments of known sensitive plant species sites and survey for noxious weed sites as part of their normal program of work. These monitoring efforts will prove valuable for guiding future management decisions and protecting Waldo Lake, but are not directly connected to this proposed action.

## Consistency with Direction and Regulations

**Willamette Forest Plan:** This proposed action tiers to the Environmental Impact Statement for the Willamette National Forest Land and Resource Management Plan (USDA, 1990a) and those environmental impact statements (USDA 1994, 2001, 2004) that have subsequently amended this plan. The 1990 Willamette National Forest Land and Resource Management Plan, as amended, assigns management areas (MA) to all acres of the Forest to direct management activities and public uses (USDA, 1990b). Forest Plan management areas around Waldo Lake are displayed in Figure 2.

Waldo Lake is classified by the Forest Plan as a Riparian Reserve, (MA 15) and is predominantly surrounded by a Dispersed Recreation, Semiprimitive Nonmotorized management area (MA 10e). Just outside MA 10e on three sides of Waldo Lake and in some places close to the shoreline is the Waldo Wilderness (MA 1a). The three campgrounds on the lake’s eastern shore are designated Developed Recreation Sites (MA 12a). Corridors around access roads to the three campgrounds are assigned Dispersed Recreation, Semiprimitive Motorized management areas (MA 10c).

Two other management areas close to Waldo Lake play minor roles in recreation use around the lake. These management areas are the Wild and Scenic River management area (MA 6f) along the North Fork of the Middle Fork Willamette River and the Research Natural Area (MA 4) to the northeast of North Waldo campground.

The Forest Plan defines a recreation setting emphasis and experience objectives through the Recreation Opportunity Spectrum (ROS) for each management area (MA), along with the human uses and facility development levels that are consistent with those objectives. Planning tools like ROS help the Forest consistently manage similar settings across the forest landscape. The ROS system recognizes three interrelated components of recreation: the experience, the physical setting, and types of activities. By considering these components together, managers can match facility development and visitor activities to the recreation setting emphasis and experience objectives assigned to each management area on the Forest. Components of the ROS system are described in greater detail in Appendix A.

Forest Plan amendment under the proposed action (and its action alternatives) would direct some recreation uses at Waldo Lake to be more consistent with resource goals and management direction contained in the Willamette National Forests Land and Resource Management Plan. The proposed action (and its action alternatives) creates environmental consequences that do not compromise the long-term productivity of land resources and protect water resources, while attempting to meet recreation experience objectives for undeveloped sections of Waldo Lake and its shoreline.

**Endangered Species Act:** The proposed action and its alternatives are consistent with Endangered Species Act direction. This determination is supported by the Wildlife BE (Appendix F).

**Executive Order 12962, Recreational Fisheries:** Recreational fisheries in Waldo Lake are limited by the lake's ultra-oligotrophic nature and State of Oregon's decision to stop its fish stocking program at Waldo Lake. The proposed action (and its action alternatives) would not have any effect on existing populations of introduced fish in Waldo Lake.

**Executive Orders 11988 and 11990:** The proposed action (and its action alternatives) would have no impact on floodplains or wetlands as described in these executive orders.

**State Historic Preservation Office (SHPO):** The proposed action (and its action alternatives) would have no impact on known historic or prehistoric sites around Waldo Lake. A letter of compliance with SHPO direction is included with this document as Appendix G.

## Irreversible and Irretrievable Commitments of Resources

No irreversible or irretrievable commitments of resources are expected to occur under this proposed action or any of the action alternatives.

## Significance of Proposed Amendments to the Forest Plan

The following factors have been evaluated to determine whether the proposed Forest Plan amendment #44 creates significant changes to the Willamette Forest Plan.

**Timing:** The Willamette Forest Plan was implemented in August 1990 and has been in place for about 16 years. The current agency schedule is for a forest plan revision to begin in the fall of 2008 and be completed by 2011. While it is not possible to predict what issues will or will not be

considered in the upcoming forest plan revision, it is likely that all land allocations and recreational uses will be reviewed for possible changes.

**Size and location:** The proposed forest-wide S&G of this amendment is limited to Waldo Lake and would not apply to recreational boat use on other lakes or rivers. Because Waldo Lake is the largest natural lake on the Forest, the proposed amendment would affect a high percentage of natural lake acres on the Forest. However, when viewed in terms of the actual amount of recreational boating use, this amendment would affect less than 5 percent of the annual boating use estimated to occur across the Forest.

Likewise, the proposed management area S&G of this amendment applies only to motorized use within a portion of MA-10e immediately adjacent to Waldo Lake and representing approximately 2072 acres. The total acres on the Forest classified as MA 10e is 49,600, so this proposed amendment would affect slightly more than 4% of the all acres currently allocated as MA 10e.

**Goals, Objectives, Outputs:** The proposed amendments would alter the long-term relationship between motorized and non motorized opportunities and potential user days at Waldo Lake. At the Forest level, the change or shift in long-term recreational opportunities between motorized and non motorized boating would be minimal. The other large lakes and reservoirs on the Forest offer a large amount of motorized boating opportunities and these uses/opportunities are not affected by the proposed amendment. The amount of motorized use at Waldo is small in comparison to the use/opportunities on these other lakes and reservoirs, so changes in the ratio or relative amounts of motorized and non motorized opportunities across the Forest would be minimal.

**Management Prescription:** The proposed S&G's are specific to the surface of Waldo Lake and the Dispersed Recreation, Semiprimitive Nonmotorized management area immediately around the lake. They would not set a precedent for future management decisions on the Forest primarily because Waldo Lake and its surrounding area offer unique recreational settings and opportunities. The type of management changes proposed for Waldo simply would not fit the existing social and physical environments of other large lakes and reservoirs on the Willamette National Forest.